

(No Model.)

R. S. GILLESPIE.
AIR LOCK FOR CAISSONS, &c.

No. 570,793

Patented Nov. 3, 1896.

Fig. 1.

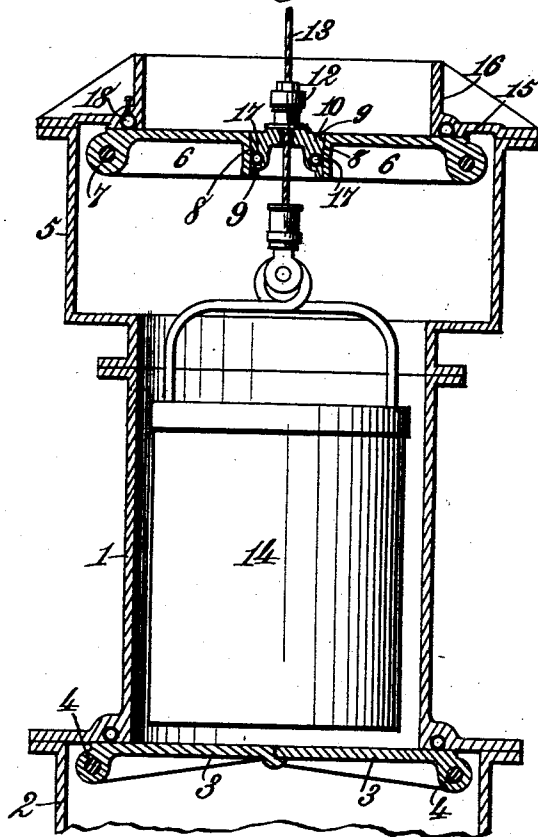
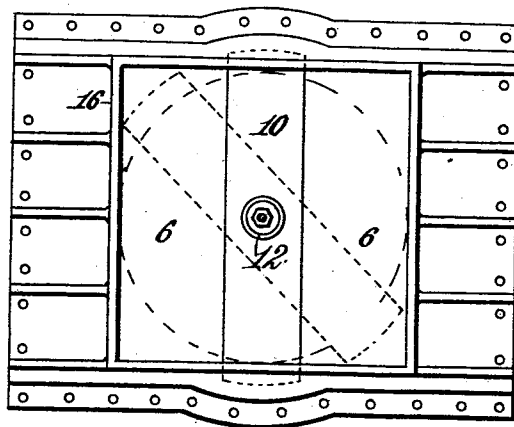


Fig. 2.



Witnesses.

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RICHARD S. GILLESPIE, OF NEW YORK, N. Y.

AIR-LOCK FOR CAISSONS, &c.

SPECIFICATION forming part of Letters Patent No. 570,793, dated November 3, 1896.

Application filed July 29, 1896. Serial No. 600,944. (No model.)

To all whom it may concern:

Be it known that I, RICHARD S. GILLESPIE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Air-Locks for Caissons, &c., of which the following is a specification.

This invention relates to air-locks which are connected with or mounted upon the upper or outer ends of caissons or tunneling apparatus designed for building subaqueous foundations or for constructing tunnels.

The object of the present invention is to provide new and improved means for opening and closing the air-lock and securing an accurate and air-tight fit of the inner edges of pivoted swinging doors, with a cross-bar or plate on which the stuffing-box of the bucket-hoisting cable is adapted to rest.

To accomplish this object, my invention consists, essentially, in the combination, with an air-lock casing, of a cross-bar or plate detachably connected with the casing and constructed with concavities in its opposite longitudinal edges, and swinging doors having convex inner edges to fit into the concavities of the cross-bar or plate when the doors are closed.

The invention also consists in several other features of construction and in the combination and arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a vertical central sectional view of an air-lock embodying my invention, and Fig. 2 is a top plan view of the same.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates the casing of an air-lock, which may be circular or of any other suitable form or shape in cross-section. The casing is provided with a chambered base portion 2, adapted to be connected with or mounted upon the upper or outer end of a caisson or tunneling apparatus. This base portion is preferably enlarged to accommodate the lower set of doors or valves 3, which serve to open and close the lower end of the air-lock casing. The doors or valves 3 are shown as

mounted on rock-shafts 4, adapted to be rocked through the medium of any suitable devices, so that the doors or valves may be swung to their opened or closed positions. 55

The lower doors or valves may be of any construction suitable for the purpose in hand, and instead of two lower doors or valves a single one may be provided.

The upper end of the air-lock casing is preferably enlarged, as at 5, to receive and accommodate the two upper doors 6, which are mounted upon rock-shafts 7, adapted to be operated by any suitable means, so that the doors can be swung downwardly to open the upper end of the air-lock or be swung upwardly to a horizontal position, as shown in Fig. 1, to close the air-lock. The inner edges or ends of the two doors 6 are curved in arcs of circles struck from the centers of the rock-shafts 7, so that these inner edges or ends are convex or arc-shaped, as at 8, and are adapted to enter and accurately fit air-tight into concavities 9, formed in the opposite longitudinal edges or sides of a cross-bar or plate 10, on which is mounted a stuffing-box 12 for the reception of the usual bucket-hoisting cable 13. This cable may be an ordinary wire rope, and it is adapted to move through the stuffing-box for the purpose of raising and lowering the bucket 14. 80

I have shown a single stuffing-box 12 and a single bucket-hoisting cable 13; but I do not wish to be understood as confining myself to this particular number, as it is possible to employ two stuffing-boxes on the cross-bar or plate, in which event two bucket-hoisting cables will be used. 85

The concavities 9 are arc-shaped and are struck from the centers of the rock-shafts 7, so that when the cross-bar or plate is in operative connection with the upper end of the air-lock, as shown by full lines in the drawings, the doors 6 may be opened or closed, and when closed their convex inner edges or ends will accurately fit the concavities of the cross-bar or plate. 95

The top portion of the chamber 5 is provided with a rectangular overhanging flange, formed by the base 15 of a rectangular frame 16, secured to the chamber in any suitable manner. This frame is constructed with a 100

central opening, which, as shown, is approximately square, the shape being such that when the cross-bar or plate 10 is turned into the position indicated by dotted lines in Fig. 2, with its ends presented to two diagonally opposite corners of the square opening, the bar or plate can be turned on the cable 13 and its ends caused to engage under the base 15 of the frame 16, as shown by full lines, Fig. 2. The cross-bar or plate will now lie across the square opening of the frame 16, and the doors 6 can then be closed and held closed in any ordinary manner. The doors will then support the cross-bars and the bucket-cable can move through the stuffing-box 12 for the raising or lowering of the bucket.

The opposite concave longitudinal edges of the cross-bar 10 are constructed with grooves, in which are arranged packing-strips 17, against which the convex or arc-shaped edges of the doors will bear when the doors are closed for the purpose of securing a perfect air-tight closure. The packing-strips 17 may be of any desired construction and material; but preferably they are made in the form of tubes adapted to be inflated by introducing a fluid thereinto.

The base portion 15 of the frame 16 is also provided with a surrounding groove, in which is arranged a packing-strip 18, against which the doors 6 bear when they are closed. The packing-strips 18 may also be of any desired construction and material; but I prefer to make them tubular, so that they can be inflated.

The stuffing-box 12 is preferably attached to the cross-bar or plate 10 and serves as a means for manipulating the cross-bar or plate; but I do not confine myself to attaching the stuffing-box to the cross-bar or plate, as it is possible to make it separate therefrom

and to manipulate the cross-bar or plate by means other than the stuffing-box.

My invention provides novel, simple, efficient, and economical means for opening and closing the air-lock for a caisson or tunneling apparatus.

Having thus described my invention, what I claim is—

1. The combination with an air-lock casing, of a cross-bar or plate detachably connected with the casing and constructed with concavities in its opposite longitudinal edges, and swinging doors having convex inner edges to fit into the concavities of the cross-bar or plate when the doors are closed, substantially as described.

2. The combination with an air-lock casing, of a frame mounted on the top portion thereof, a cross-bar or plate detachably engaging the under side of the said frame and constructed with concavities in its opposite longitudinal edges, and swinging doors having convex inner edges to fit into the concavities of the cross-bar or plate when the doors are closed, substantially as described.

3. The combination with an air-lock casing, of a cross-bar or plate detachably connected with the casing and constructed with concavities in its opposite longitudinal edges, a stuffing-box attached to and carried by the cross-bar or plate, and swinging doors having convex inner edges to fit into the concavities of the cross-bar or plate when the doors are closed, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

RICHARD S. GILLESPIE.

Witnesses:

ALBERT H. NORRIS,
THOS. A. GREEN.